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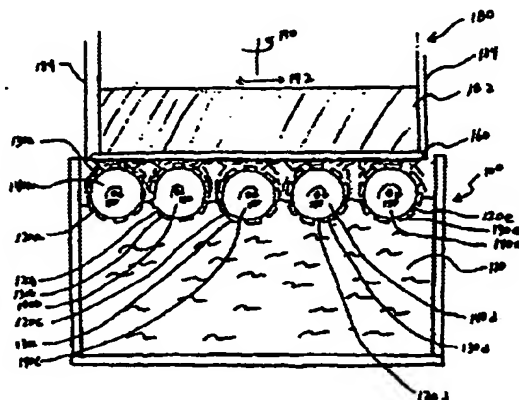
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(54) Title: SEMICONDUCTOR WORKPIECE PROXIMITY PLATING METHODS AND APPARATUS



(57) Abstract: The present invention relates to methods and apparatus for plating a conductive material on a semiconductor substrate by rotating pad or blade type objects in close proximity to the substrate, thereby eliminating/reducing dishing and voids. This is achieved by providing pad or blade type objects mounted on cylindrical anodes or rollers and applying the conductive material to the substrate using the electrolyte solution disposed on or through the pads, or on the blades. In one embodiment of the invention, the pad or blade type objects are mounted on the cylindrical anodes and rotated about a first axis while the workpiece may be stationary or rotate about a second axis, and metal from the electrolyte solution is deposited on the workpiece when a potential difference is applied between the workpiece and the anode. In another embodiment of the present invention, the plating apparatus includes an anode plate spaced apart from the cathode workpiece. Upon application of power to the anode plate and the cathode workpiece, the electrolyte solution disposed in the plating apparatus is used to deposit the conductive material on the workpiece surface using cylindrical rollers having the pad or blade type objects.

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